SEH TRANSMITTAL

To: Ms. Deborah Ehlert
U.S. Environmental Protection Agency, Region 8
999 18th Street, 8EPR
Denver Colorado 80202-2466

Date: March 30, 2004
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Client No.:

Re: Rico Townsite Soils VCUP Application

We are:
☒ Enclosing ☐ Sending under separate cover ☐ Sending as requested

On behalf of Atlantic Richfield Company, please find enclosed a copy of the revised Rico Townsite Soils VCUP Application submitted to the Colorado Voluntary Cleanup Program, by Atlantic Richfield, Rico Renaissance, Rico Properties, and the Town of Rico as co-applicants for investigation and cleanup of lead soils in the Rico Townsite.

The VCUP Application may also be viewed in .pdf format at www.sehinc.com/online/rico/index.htm.

For your:
☒ Information/Records ☐ Review and comment ☐ Approval
☐ Action ☐ Distribution ☐ Revision and resubmittal

Remarks:

By: Douglas M. Yadon, PE

c: (transmittal form only) Dave McCarthy, Jean Martin, Mark Walker, Robert Eber, Ashton Harrison, Tom Clark, Eric Heil, Ramone Escure, Stan Foster

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Rico Townsite Soils
VCUP Application
Rico, Colorado

Submitted to:

Colorado Department of Public Health and Environment

Submitted by:

Atlantic Richfield Company
Rico Renaissance, LLC
Rico Properties, LLC
Town of Rico

March 19, 2004

Rico Townsite Soils
VCUP Application

Rico, Colorado

Prepared for:

Atlantic Richfield Company
Rico Renaissance, LLC
Rico Properties, LLC
Town of Rico

Prepared by:

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This Application for participation in the Colorado Voluntary Clean-up Program (VCUP) is being submitted to address concentrations of lead in soil that may pose a potential health risk to residents of the Town of Rico (Town). Areas to be addressed include: 1) existing residential, commercial and mixed use development in Town; and 2) areas within and immediately contiguous to the current Town limits to the south, east and west that are zoned and/or Town-approved as Residential Planned Unit Developments (RPUDs). These areas taken together define the "Site" as generally located on Figure 1 and shown in more detail on Figure 2. Atlantic Richfield Company; Rico Renaissance, LLC; Rico Properties, LLC; and the Town of Rico (collectively, the "Applicants") support this Application as co-applicants. The Town of Rico is participating as a VCUP applicant to provide access to its properties for VCUP activities, and to facilitate and coordinate public participation and access to non-Applicant properties within the Town of Rico for data gathering and cleanup, if required.

All investigations, cleanup activities and document submittals under this VCUP will be the responsibility of and carried out by Atlantic Richfield Company, Rico Renaissance, LLC and Rico Properties, LLC (collectively, the "Rico Work Group") with the support of the Town. The Rico Work Group will fund Colorado Department of Public Health and Environment (CDPHE) oversight activities.

This Application proposes a phased investigation and cleanup to effectively address lead risks at the Site in a thorough and timely manner, with regulatory knowledge and approval. This phased approach is proposed for the following reasons:

- Additional data gathering in Phase I is warranted to evaluate the health risk to the community and to develop specific clean-up actions for CDPHE consideration and approval. Prior soil lead investigations in the Rico area have not been comprehensive in scope and have not targeted the collection of data necessary to support the design and implementation of specific clean-up actions of Site soils. Data from the most recent of these studies, the October 2003 sampling of residential properties by the United States Environmental Protection Agency (U.S. EPA), was recently made available to the Applicants and will be considered as risk assessment or clean-up planning progresses in Phase I.
- Under the proposed phased approach, after further samples are taken, cleanup actions to address potential immediate exposures will proceed during the 2004 construction season under Phase I.
- Comprehensive data from the Phase I studies will then be used to develop and implement any further clean-up actions and related activities that may be needed under Phase II.

The purpose of this Phase I submission is to:

- Provide general application information regarding known environmental conditions.
- Present methods for further sampling and analysis of soils to document the distribution of lead in soils at the Site.
- Identify methods for risk determination and development of a risk-based action level.

- Present a general description of remedial actions planned for the Van Winkle mine site and a limited number of residences where concentrations of lead in soil may justify accelerated action within the 2004 construction season.

Additional documents that will be generated during the VCUP process include:

- Phase I Work Plan and Preliminary Data Report – This document will present an evaluation of the 2003 U.S. EPA soil sampling results (a request has been made to U.S. EPA to provide all additional relevant information, including data validation), a preliminary assessment of the results of the additional sampling and analysis to be performed pursuant to this VCUP Application, and detailed plans for Phase I clean-up of townsite properties identified as potentially posing an immediate health risk (currently proposed as sites with lead concentrations in surface soils greater than or equal to 3,000 milligrams per kilogram [mg/kg] or parts per million [ppm]). In addition, a site-specific plan for remediation of the Van Winkle mine site and other priority clean-up areas identified in consultation with CDPHE will be included.

- Phase I Risk Assessment and Final Data Report – This report will present the results (including data validation) and final evaluation of the Phase I soil sampling and analyses, and the detailed methodology and results of the human health risk assessment. These results will provide the basis for assessing the protectiveness and permanence of Phase I clean-ups, and provide the health risk-based action level(s) for Phase II remediation of lead in soils at additional properties.

- Phase II Work Plan – This document will present the detailed remediation plan for residential and other properties exceeding the applicable action level(s) identified by CDPHE and address, as appropriate, institutional controls (ICs) for future development.

- Completion Report/No Further Action Determination – Upon completion of all clean-up pursuant to this VCUP Application, a final report will be prepared documenting the work performed under both Phase I and Phase II, and compliance with all the relevant requirements of the VCUP Application and the associated work plans and reports.

The Applicants anticipate that Phase I activities will be completed in 2004 and that Phase II activities will be completed in 2005. A schedule of key deliverables and major work elements is presented in Section 4.3 of this Application.

1.0 General Information

1.1 Name and Address of Owner

This Application is submitted by Atlantic Richfield, Rico Renaissance ("RR"), Rico Properties ("RP"), and the Town of Rico (Town). RR, RP and the Town are owners of real property within the Town limits; Atlantic Richfield does not own real property in the Rico area. These entities are collectively referred to in this report as "the Applicants." A map showing property owned by the Applicants, together with existing Town rights of way, properties planned to be dedicated or donated to the Town, and U.S. Forest Service properties planned for acquisition and future development is in preparation and will be submitted to CDPHE with the Phase I Work Plan and Preliminary Data Report.

1.2 Contact Person and Phone Number

Contacts for the Applicants include:

Atlantic Richfield:	Dave McCarthy	406-782-9964, ext. 430
Rico Renaissance:	Ramone Escure	970-728-6116
Rico Properties:	Stan Foster	970-749-7126
Town of Rico:	Eric Heil	970-967-5550

1.3 Location of Property

The Site consists of lands within the present limits of the Town of Rico, Colorado, and those portions of immediately contiguous Residential Planned Unit Developments (RPUDs) to the east, south and west of the Town that are included in the current approved Rico Master Plan. Figure 1, "Rico District Location Map," identifies the general location of the Town of Rico and Figure 2, "Town of Rico Site Boundary Map," shows the area within the current Town boundary and the general location of the portions of the approved RPUDs outside the Town limits that together comprise the Site.

1.4 Type and Source of Contamination

Lead in soils may pose an unacceptable health risk to Town residents. The source of the lead in soils may be attributable to mining/processing activities, lead paint, other anthropogenic sources or high naturally occurring levels of lead.

1.5 Voluntary Clean-Up (VC) or No Action Determination (NAD)

This Application is for a Voluntary Clean-up under Colorado's Voluntary Clean-up and Redevelopment Act.

1.6 Application Organization

The Colorado VCUP requirements and checklist were consulted in the preparation of this Application. Because this Application is for a Site that includes no current related industrial

operations, the VCUP checklist is, in some instances, not applicable to the Site. This Application focuses on VCUP requirements that are most relevant to the resolution of issues related to lead in soil within the Site boundaries. For completeness, the VCUP Checklist and additional information to address less relevant checklist items are included in Appendix A, "Colorado VCUP Application Information."

2.0 Environmental Assessment

2.1 Address and Legal Description of Site

This Application for participation in the VCUP is being submitted to address concentrations of lead in soil that may pose a potential health risk to residents of the Town of Rico and in immediately contiguous areas approved for future residential development in the current Rico Master Plan. The Site location includes areas within the Town of Rico boundary and RPUD areas where these extend beyond the current Town limits as shown on Figure 2.

2.2 Operational History

2.2.1 Introduction

The mining-related operations in the area of Rico, Colorado started with the staking of the first mining claim in 1869. Since then a variety of mining-related activities have taken place within and nearby to the Town of Rico. The following sections outline the key historical periods of mining-related activities within the Town area with a focus on identifying the age, location, and nature of specific operations. Important references for this historical information have been (Ransome, 1901) for the early history of operations and (McKnight, 1974) for the later history. Other references are noted in the text where appropriate.

2.2.2 1869-1894

After the first mining claim was staked in 1869 (the Pioneer claim located at the mouth of Silver Creek), there was sporadic surface and near-surface exploration with limited success until high-grade silver ores were discovered in 1879. During this period 9,235 tons or 11 percent (%) of the district's total lead production took place.

The Atlantic Cable shaft was sunk during this period, but it was primarily exploratory in nature. Much of the high-grade silver processing included milling and smelting operations at the Grand View smelter (constructed in 1880) and another smelter at the south end of town (Pasadena) constructed in 1882.

Another important development during this period of Rico's history was the completion of the Rio Grande Southern Railroad into town in 1890. This narrow gauge railroad had significant facilities within town including, a station house, fueling areas, a turnaround spur, a water tower (still standing), and side spurs up Silver Creek and to Newman Hill (Enterprise Mine). With the exception of one standing water tower, the railroad's presence is primarily evidenced today by the old railroad grade which remains as a dirt road and trail along the Dolores River, and widespread scattering of debris, such as cinders and coal, at various places along the river corridor.

2.2.3 1894-1929

Production of metals in Rico continued during this period but lead averaged only 335 tons. The Pro Patria mill was developed in 1902. In addition, a small mill using magnetic separation technology was developed at the Atlantic Cable mine. An aerial tram was used to bring ore down

to the Pro Patria mill from the Newman Hill area. The Pro Patria and Atlantic Cable sites are within the Town of Rico. Details of the Pro Patria mill history are included in a prior VCUP application (Columbia Tailings, Pro Patria Tailings, and Silver Swan East Waste Rock Pile Application approved March 4, 1996) (ARCO, 1996a). In general, local processing was minimal during this period as the technology needed to handle the ores satisfactorily was not available.

The Pro Patria became a 250 ton-per-day flotation mill in 1926 and was active between October 1926 and July 1928 (when it was permanently closed); this mill processed most of the ore produced in the district. At other times during this period, ore production was shipped to the Salt Lake area for processing. All major mining areas were active at this time including the Shamrock and Atlantic Cable mines within the Town of Rico. Tailings from the Pro Patria mill are thought to mostly be impounded at the Columbia Tailings site (ARCO, 1996a). Although this was a relatively short period, activity was high and the peak base metal production for the district was reached in 1927 when 4,994 tons of lead was produced. With the Great Depression of 1929, mine operations in the Town of Rico came to an end.

2.2.4 1929-1970

There were not significant mining operations in the Rico townsite during the Great Depression years and the period that followed (1929-1939). Outside the townsite, the Rico Argentine Company built a 135-ton per day flotation mill up Silver Creek in 1939 and production from most mines of the area was processed here in subsequent years. Overall, production from several mines fed the Argentine mill on Silver Creek and 56% (over 47,000 tons) of the lead and 72% (over 59,000 tons) of the zinc production from the district took place during this period.

The Van Winkle shaft, sunk in 1942, provided significant ore to the Argentine mill for several years. This is the only production that took place within the Town of Rico during this period.

The period from 1939 to 1971 was the time of most lead production in the district, and it came to a close in 1971 when the Rico Argentine mines and mill were shutdown. Some efforts to develop commercial mining enterprises did take place later but the time of significant mining activity in the area ended with shutdown of these facilities.

2.2.5 1970-1988

On the west side of Rico, mining by Silver Bell Industries produced some 75,000 tons of sulfide ore from the Santa Cruz mine area from 1970-1975. This ore was shipped to a mill in Ophir, Colorado and not processed in the Rico area. More details of the history of this operation are provided in a prior VCUP application for the Santa Cruz mine site (ARCO, 1996b).

The Anaconda Company entered an Agreement in June 1978 with Rico Argentine Mining Company, a division of Crystal Exploration and Production Company, under which The Anaconda Company obtained exclusive possession of Rico Argentine Mining Company's mineral properties in the Rico vicinity for exploration purposes. The Anaconda Company also acquired an option to purchase such properties under that Agreement. Pursuant to a June 1980 Letter Agreement and an August 1980 Closing Agreement with Crystal Exploration and Production Company, a subsidiary of Crystal Oil Company, The Anaconda Company acquired Rico Argentine Mining Company's surface and mineral properties in the Rico area. Atlantic Richfield Company, a successor to Anaconda, subsequently sold these properties to Rico Development Corporation under a Purchase and Sale Agreement executed in May 1988.

2.2.6 1988-Present

Mining-related activity has been minimal since 1988. In its place, the Town is now experiencing a time of revitalization that accompanies real estate development as a Colorado mountain village near a major ski resort (Telluride). New roads, expansion of the community water system, active zoning, and planning as a residential and recreational center is underway.

2.2.7 Summary and Prior VCUPs in Rico

Throughout Rico's history, mining and related activities have primarily been located nearby but outside the Town of Rico. The principal mining-related operations within the Town of Rico have derived from:

- Early processing of small volumes of silver-rich ores at the Grand View and possibly one other smelter.
- Early surface and near surface exploration at the Shamrock and Atlantic Cable mines where sulfide mineralization was exposed in outcrop (Ransome, 1901).
- Operation of the Pro Patria mill and related facilities such as trams for a short period in the 1920's.
- Production from the Van Winkle mine, primarily in the 1940's.
- Between 1894 and 1938 the Rio Grande Southern Railroad shipped sulfide ore for processing elsewhere, primarily in Utah. The railroad's facilities were mostly located along the river corridor.

The Grand View smelter processed oxidized, silver-rich ores that contained low lead and zinc contents compared to non-oxidized sulfide ores of the district. These ores, produced from mines on NB Hill above elevations of 9,600 feet, were processed in a small blast furnace to separate silver-rich bullion from waste material or slag. Remnants of this slag are still present locally at the surface. Another smelter (Pasadena) was historically located at the south end of town. This smelter, apparently constructed in 1882 and operational for a short time in the 1880's, probably processed silver-rich ores from the Newman Hill area. Surface evidence for its location and nature is not visible today.

Clean-up actions were completed at several sites within the Town of Rico in 1996 pursuant to two prior VCUP applications. One of the prior applications dealt with the Columbia Tailings, Old Pro Patria Mill Tailings, Shamrock Mine Waste Rock Pile and Silver Swan East Waste Rock Pile sites (ARCO, 1996a) by consolidating tailings and waste rock at the Columbia Tailings site. The Columbia Tailings site was then graded to provide runon/runoff control, covered with growth media and revegetated to prevent direct contact with the waste soil/rock, and armored with riprap to protect against flooding of the adjacent Dolores River.

The Grand View Smelter site (ARCO, 1996c) was remediated by relocating the small volume of waste rock present (approximately 100 cubic yards) to the Columbia Tailings site, and then covering with growth media and revegetating the removal area. Minor grading was done locally to maintain the pre-existing runon/runoff drainage slopes/patterns, and an area adjacent to the Dolores River was protected from erosion/flooding by constructing a riprap revetment.

2.3 Current and Proposed Land Use and Zoning

The current range of land use for the Town of Rico is typical for a small Colorado mountain town. Rico is a zoned community with a Master Plan to guide its future development. Land use within the Rico townsite includes residential, commercial, public facility, mixed use, and open space areas. Zoned areas are shown on Figure 3, "Town of Rico Zoning Map." Historical preservation, recreation, and tourist-related developments are important to Rico's future. The outline for longer-term land use is generally described in Figure 4, "Rico District Proposed Master Plan." Community plans place the Grand View smelter site within a commercial/residential zone, and the Atlantic Cable mine headframe area is planned open space committed to historical preservation. The Van Winkle shaft and waste rock area is planned open space committed to historical preservation. Various mining- or railroad-related sites along the Dolores River, such as the Pro Patria and Columbia Tailings sites are planned open space within the Town's projected River Corridor that is set aside for recreational use. The proposed overall land use for the Town of Rico will be similar to current uses, with plans for future expansion of residential and commercial/light industrial development.

2.4 Physical Characteristics

2.4.1 Topography

Rico is located in the high relief southwest part of the San Juan Mountains where very steep to steep mountain slopes, and steep to moderate sloping tributary stream valleys, abruptly descend upon the gently to moderately sloping and relatively narrow Dolores River valley (Figure 2). Many of the steep draws and gulches formed on the hillsides on both sides of the Dolores River and its Silver Creek tributary are snow avalanche chutes. Elevations in the Rico area generally range from over 12,000 feet at the crest of surrounding mountain peaks, such as Telescope Mountain (12,201) and Dolores Mountain (12,112) to 8,700± feet in the Dolores River valley at Rico.

The intersection of Glasgow Avenue (Highway 145) and Mantz Street in the Town of Rico is at about 8,800 feet elevation. Most of present day Rico is built on moderate to low slopes developed where tributaries deposit alluvial fans on the Dolores River flood plain. These low slopes continue to be preferred for development but because of their limited area, new development (particularly residential), is expanding onto steeper slopes surrounding the Town (Figure 2).

2.4.2 Surface Water Bodies and Wastewater Discharge Points

The Dolores River below the Town of Rico has a mean annual historic flow of 132 cubic feet per second (cfs) with a typical seasonal flow range of between 20 and 600 cfs. The annual high flows occur during snowmelt runoff in May and June. The annual low flow period occurs in November through March with January and February having the lowest average monthly flow of 19 and 18 cfs, respectively. The 100-year flood peak is estimated at about 2,700 cfs (Dames and Moore, 1981).

Silver Creek, the principal tributary to the Dolores River in the area, drains through the Town of Rico. The gradient of the relatively narrow cobble and boulder-lined channels is moderate where it passes through Rico. Historic instantaneous measurements of Silver Creek flow below the Argentine tailings ponds range from about 0.06 cfs to 23 cfs. Most annual high flows occur during snowmelt runoff in the spring and early summer months (April-July). Infrequent floods result from high-intensity rainfall during the summer months. The 100-year flood peak flow is

estimated at about 525 cfs (Dames and Moore, 1981). In Rico, the channel is locally incised and confined by flood control banks.

2.4.3 Groundwater Monitoring and Supply Wells

The surface waters within the Town of Rico are not used as a water supply source for the Town. Silver Creek, from a diversion point located approximately 1.25 miles above the townsite, is the Town's current source of water (Figure 2). The Town of Rico is in the process of obtaining the approvals necessary to utilize shallow alluvial groundwater in the Dolores River valley north of town for water supply and discontinue use of the Silver Creek Diversion.

There are no known ground water monitoring or supply wells within the Town of Rico. Colorado Division of Water Resources records were searched for all registered wells in the east end of Dolores County. Most of the wells on record are located in the Dunton area within the West Dolores River Basin (Figure 1).

There are three registered supply wells in the Rico area. These are located upstream and north of the town on the west side of the valley north of the townsite. Two of the wells supply water for domestic use and are located one mile upstream of the town. The third well was used by the Colorado Department of Transportation. This well has been abandoned and plugged. There are no known unregistered water wells within the townsite or along the Dolores River. Three small diameter (2 inch) piezometers (perforated PVC pipe) were installed in alluvium on the perimeter of the Columbia Tailings pile in October 1995 to determine the depth to water. These piezometers have since been abandoned. There are no known unregistered water wells within the townsite or along the Dolores River.

Several groundwater samples were taken in the fall of 2002 as part of a Colorado Department of Public Health and Environment (CDPHE, 2003) Brownfields study. These samples were collected at the Dolores County Maintenance Barn site within the Town and all indicated non-detectable levels of lead in groundwater.

2.5 Contaminant Releases

2.5.1 Chemical Nature and Extent

Several previous investigations in the Rico area have included the sampling and analysis of townsite soils for lead, although none have been specifically designed to fully characterize the distribution of lead or to provide the basis for decisions on remedial action. These previous investigations are summarized in Section 2.5.5.

The distribution and concentrations of metals, including lead, in the bedrock and surficial soils in the Town of Rico reflect the influence of the historic hydrothermal system in the area. The bedrock in the Town has the highest overall metal content and the colluvium derived from this bedrock is nearly as high. The principal sources of metals are natural. The townsite is developed on these natural materials and the mining-related impacts such as waste rock and tailings piles are definable. Development of the Town has had a large impact on the original natural surfaces. However, townsite development has not significantly changed the natural metals distribution (ARCO, 1996c).

2.5.2 Groundwater Depth

No existing groundwater monitoring or water supply wells are known to be located within the Town of Rico. Therefore, no data exist to document water table elevations or groundwater movement across the town. Short-term measurement of the piezometers at the Columbia Tailings site noted previously indicated a local groundwater gradient downstream and toward the Dolores River, as would be expected in the shallow alluvial aquifer being monitored. A generally similar pattern of downslope (toward the Dolores River) and downstream groundwater flow would be expected within the alluvial and colluvial deposits underlying much of the Town of Rico.

2.5.3 Groundwater Contamination Potential

This VCUP Application addresses the presence of lead in soils within the Town of Rico. Based on relatively recent data from the Colorado Department of Public Health and Environment (CDPHE, 2003), the potential for impact to groundwater from these soils is judged to be low. Lead values from five groundwater sampling locations in the vicinity of the County "Maintenance Barn" were all reported as non-detects (ND). These groundwater sampling locations were in the same area as four surficial soil sampling sites for which lead values were reported to range from 620 to 4500 ppm), with an average concentration of 2580 ppm. Furthermore, there are no municipal water supply wells within the town.

2.5.4 Hydraulic Tests

No hydraulic tests of aquifers are known to have been performed within the Town of Rico.

2.5.5 Site Soil

Data from five previous studies are available to help define the heavy metal contents of bedrock and surficial materials in the Town of Rico.

Walsh (1995) – Walsh Environmental Scientists and Engineers, Inc. conducted a Phase I and Phase II Environmental Site Assessment (ESA) in and around the Town of Rico that included limited sampling of waste rock piles, mine tailings, and fill material. Forty-eight samples were collected, targeting areas of interest to Rico Renaissance, LLC. Thirteen of the samples were in commercial/residential areas and seven were in locations considered background.

ARCO (1996c) – As part of the VCUP application for the Grand View Smelter, ARCO incorporated data from the PTI Environmental Services sampling performed in 1995. The PTI study included 73 soil sampling locations, 32 of which were residential surface samples, 20 of which were background surface samples, and 20 of which characterized 10 residential sampling locations at depth. One sample was collected from mine waste at the Van Winkle Mine site.

Titan (1996) – Titan contracted with Michael Russ to perform geological and geochemical mapping of soils in the Rico area to characterize metals concentrations in relation to the mineralogy of the source material and historic mining and processing operations. Twenty-four rock outcrops and 22 surficial deposits were sampled as part of this study. The study concluded that concentrations of selected metals (including lead) in surficial deposits are derived predominantly from geologic processes acting on natural sources.

State of Colorado Brownfields (2003) – The Colorado Department of Public Health and Environment (CDPHE) conducted limited groundwater and surface soil sampling as part of

Brownfields assessment fieldwork in late 2002. Four surface soil samples were collected at the Dolores County "Maintenance Barn" site within the Town of Rico. Lead concentrations in these samples ranged from 620 to 4500 ppm and averaged 2580 ppm.

U.S. EPA (2004) – The U.S. EPA sampled soils at numerous properties within the Town of Rico in October 2003. Data from this sampling event were only recently made available and therefore, have not yet been thoroughly reviewed by the Applicants for use in the overall evaluation of the Site. Other field information, and data validation results have been requested from U.S. EPA and will be considered in preparing the Phase I Work Plan.

Sampling locations from the first four studies above are depicted on Figure 5, "Prior Sampling Locations and Risk Assessment Exposure Areas." Figure 6 "October 2003 EPA Sampling Locations" shows the locations and associated soil lead concentrations from the latest sampling (EPA, 2004). Together, these figures present the currently known surface soil lead characterization for the Rico townsite. Additional soil samples are required to fully characterize the townsite surface soils with respect to lead. A summary and analysis of all sampling events will be presented in the Phase I Risk Assessment and Final Data Report, following sampling activities.

2.5.6 Environmental Sampling

As part of the Applicants' Phase I Work Plan and Preliminary Data Report, previous investigation data will be incorporated, as appropriate, to support risk assessment and remedial planning. Additional soil sampling and analyses are proposed to supplement the existing database. The protocol for the additional sampling and analysis is detailed in the Sampling and Analysis Plan (SAP), which is submitted as part of this VCUP Application in Appendix C. The following subsections summarize the key elements of the SAP. Quality assurance procedures, documenting data quality objectives, quality assurance/quality control measures, and field and laboratory standard operating procedures (SOPs) will be submitted to CDPHE for review and approval prior to initiating fieldwork.

2.5.6.1 Soil Sampling and Analysis

This section describes the overall approach and methods to be applied to the sampling of soils from properties within the Site as previously defined. Specifically, this section discusses the investigation boundaries, property types, sampling protocols, and analytical parameters. This information should be viewed as preliminary, as the approach may be modified with CDPHE approval once relevant data from all previous investigations is made available to the Applicants and has been thoroughly reviewed for use in risk determination/remedial planning.

2.5.6.1.1 *Investigation Boundaries*

The investigation of soils will be limited to properties within the Town boundary and portions of RPUD areas immediately contiguous to the east, south and west of the current Town limits. Emphasis will be given to residential, commercial, public and open space (recreational) parcels in the existing developed portions of Town that may present a current unacceptable exposure to lead (see Zone 1 on Figure 7, "Preliminary Delineation of Soil Sampling Zones"). Sampling will also be performed on properties within the Site that are available and/or currently planned for future development (see Zone 2 on Figure 7). The specific location and density of sampling in Zone 2 will be based upon the availability and quality of previous sampling data, the geology/mineralogy of soils, and near-term land use plans.

2.5.6.1.2 *Types of Properties*

The Town of Rico official zoning map (Figure 3) identifies a number of different land uses, each of which presents its own considerations for exposure and abatement that must be considered in formulating a sampling plan. Sampling of any property is subject to obtaining access from the landowner. The categories of currently zoned properties to be sampled include: Residential, Commercial/Historic Commercial, Residential/Commercial Planned Unit Development (RPUD/CPUD)/Mixed Use, and Open Space/Public Facilities. Key considerations for sampling at each of these property types are discussed in the SAP (Appendix C).

2.5.6.1.3 *Soil Sampling Protocol*

Soil sampling protocols applicable to properties in currently developed areas (Zone 1) versus properties in areas of potential future development (Zone 2) and the specific sampling protocols to be applied to each of the property types previously identified are described in the SAP (Appendix C). In summary, surface soil samples in currently developed areas (and at any dispersed developed residential properties that may fall outside the Zone 1 boundaries) will be collected from a depth of 0 to 1 inch at five randomly selected locations at each of up to several sampling sections on each property or lot (whether currently vacant and/or occupied or not). These five samples will be composited into a single sample for analysis. Locations for depth sampling will be randomly selected at an approximate rate of one depth sample per three existing residential/commercial properties sampled. Intervals for depth samples will be 0 to 6 inches and 6 to 12 inches. Additional residential samples will be collected in driveways, gardens, and play areas.

Surface soils on properties in areas of potential future development (Sampling Zone 2) will be sampled at a frequency of approximately one sample per 25 acres. Each sample will be composited from 5 randomly selected sub-samples taken within the approximately 25-acre section.

Additional sampling of potential source material, Open Space/Public Facilities, and Town streets within the Site will be performed relative to the associated exposure potential in accordance with the protocol for one of the other categories discussed here. Additional details regarding this sampling are discussed in the SAP (Appendix C).

2.5.6.1.4 *Bioaccessibility Samples*

As a subset of soils sampled throughout the Town of Rico, twelve surface soil samples specially sieved through a No. 60 screen will be analyzed for *in vitro* bioaccessibility and lead as described in the SAP (Appendix C).

2.5.6.1.5 *Analytical Procedures*

- Lead – Soil samples will be analyzed using laboratory-grade x-ray fluorescence (XRF). A subset of these samples will also be submitted for laboratory analysis using inductively coupled plasma (ICP) to establish a valid correlation between the results of the two methods as described more fully in the SAP (Appendix C).

- *In vitro* Bioaccessibility – The 12 samples selected as described above will be submitted for in vitro bioaccessibility testing according to the methodology described in the SAP (Appendix C). This analysis will be performed on the sieved portions of the samples.

3.0 Applicable Standards/Risk Determination

3.1 Describe Applicable Standards/Guidance

Applicable standards for lead in soil are not available from the State of Colorado. On the federal level, U.S. EPA's (2001) *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites* (hereafter called the "Soil Screening Guidance") publishes a generic (i.e., not site-specific) screening level of 400 mg/kg for lead in soil. According to the Soil Screening Guidance, soil screening levels (SSLs) should not be considered national cleanup values; and concentrations in soil above the screening level do not automatically trigger a response action. Rather, exceeding a screening level suggests that a further evaluation of the potential risks posed by site contaminants is appropriate to determine the need for a response action (U.S. EPA, 2001).

Health risks associated with lead exposures are assessed by determination of the potential to exceed a concentration of lead in the blood associated with increased potential for adverse health effects. The Center for Disease Control (CDC) and U.S. EPA have adopted 10 micrograms lead per deciliter of blood (µg/dl) as a risk management action level for children based on studies that indicate that exposures resulting in blood lead levels at or above this concentration may present an increased health risk to children (CDC, 1997 and 2002; U.S. EPA, .1998). Agency management decisions seek to limit the risk that exposures will result in blood lead concentrations at or above this level using site-specific risk assessments to ensure the likelihood that such exposures will occur is reduced (U.S. EPA, 1994 and 1998).

Two models have been developed for use in predicting potential blood lead levels in children and adults exposed to lead in soils, and are recommended by U.S. EPA as primary risk assessment tools for establishing risk-based remediation goals at residential and non-residential sites where exposure to soil lead is a concern. A brief discussion of each of these models as it relates to the assessment proposed in this Application is presented in the subsections below.

3.1.1 Model for Establishing Residential Remediation Goals at Soil Lead Exposure Sites

U.S. EPA's Office of Solid Waste and Emergency Response (OSWER) published guidance to promote consistent decision-making at residential lead sites managed under the U.S. EPA's Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Resource Conservation and Recovery Act (RCRA) (U.S. EPA 1994 and 1998). The OSWER guidance recommends the use of the Integrated Exposure Uptake Biokinetic (IEUBK) Model for Lead in Children for establishing risk-based remediation goals at residential sites. According to the guidance, the IEUBK model is considered the best tool for predicting the potential lead levels in children exposed to lead in the environment. The risk reduction goal described in the guidance and recommended by U.S. EPA is intended to "...limit exposure to soil lead levels such that a typical (or hypothetical) child or group of similarly exposed children would have an estimated risk of no more than 5% of exceeding a 10 µg/dl blood lead level" (U.S. EPA 1994 and 1998).

The IEUBK model will be used in the assessment proposed herein to determine appropriate remediation goals for residential exposure units identified at the Rico Site.

3.1.2 Model for Establishing Commercial, Industrial, and Recreational Remediation Goals at Soil Lead Exposure Sites

For non-residential exposures to soil lead, U.S. EPA's Technical Review Workgroup (TRW) for lead recommends use of the Adult Lead Methodology (ALM) (U.S. EPA, 2003). The ALM model equations are designed to be protective of a "fetus of a worker who develops a body

burden as a result of non-residential exposure to lead." According to the TRW, protection of the fetus is the most health sensitive endpoint for adult workers. This makes remediation goals using the ALM sufficiently protective of male or female adult workers in a non-residential setting. Similar to the IEUBK model for residential exposure, the ALM model equations target cleanup goals that equate to no more than a 5% probability that fetuses exposed to lead would exceed a blood lead of 10 µg/dl (U.S. EPA, 2003).

The ALM model will be used in this assessment to determine appropriate remediation goals for commercial, industrial, and recreational exposure units identified at the Rico Site.

3.2 Describe Current and Future Exposures at the Site

This section describes known information regarding current and future exposures at the Site based on site-specific soil lead data currently available. In addition to existing site soil lead data, it is anticipated that the assessment approaches detailed in this document will also incorporate a validated data set of U.S. EPA's 2003 sampling results (U.S. EPA, 2004) and sampling results obtained as part of the additional sampling proposed in this Application.

3.2.1 Extent of Soils Contamination

Table 1, "Rico Residential and Recreational Soils Data" and Table 2, "Summary of Lead Concentrations in Rico" summarize existing surface soil lead data results from previous investigations conducted at the Site. Data are delineated by designated exposure areas previously identified at the Site and depicted in Figure 5. For comparison, Figure 3 and Figure 4 show official zoning designations currently applicable to the Site and anticipated future zoning based on approved Master Plan Amendments, respectively.

Given the high background levels of lead in soils at Rico (see Table 2), residential soils in North and South Rico were statistically compared in a previous study (ARCO, 1996c) to background concentrations for these areas to determine if the current residential levels were statistically similar to background. The T-test statistic is used to test the equality (or similarity) of the population mean. If two soil sample populations have statistically similar means, then the populations are considered similar at a given statistical significance level. Table 3, "Summary of T-Test Results for Comparison of Lead Concentrations in Soils with Background," presents the results of this earlier comparison, which showed statistical similarity between lead concentrations in the background residential soils and residential exposure areas. This comparison will be updated once the two additional datasets described above are available, and the results will be presented in the Phase II Risk Assessment and Final Data Report.

3.2.2 Maximum Detections of Soils Contamination

Table 2 presents a summary of the mean, 95% upper confidence limit on the mean (UCLM), and the range (min-max) of lead data from a previous study (ARCO, 1996c) for each of the identified exposure areas at Rico. This table will be updated once the two additional datasets described above are available. Due to the highly mineralized nature of the natural soils in the Rico area, it is necessary to consider concentrations in areas affected by historic discharge or redistribution of mine waste source material with background concentrations in unaffected areas. It should be noted that there are different background values for soils with different origins, and in general, the colluvium soils in the main residential areas reflect highly mineralized zones, while the talus on the valley sides (i.e., East and West Valley areas) is much lower in metals. Thus, different background datasets were developed for areas of the town with soils of different origins.

The maximum for lead for the North Rico residential exposure area (3,920 mg/kg) appears based on previous data to be much less than the maximum for lead in the North Rico background samples (9,300 mg/kg). Comparison of 95% UCLM values from these two datasets indicates that lead concentrations for the north residential exposure area are below the background levels for these areas and therefore, represent naturally occurring concentrations.

The maximum for lead in the South Rico residential exposure area (1,500 mg/kg) appears to be slightly greater than the maximum for lead in the South Rico background samples (1,080 mg/kg).

The maximum values for lead (see Table 2) in the East and West Future residential exposure areas (412 and 441 mg/kg, respectively) are low based on the prior data and apparently represent undisturbed naturally occurring concentrations in these areas.

Figure 8, "Range of Lead Concentrations Versus Exposure Areas," presents a graphical display of lead concentrations for each area. With the exception of the River Corridor, lead concentrations for each area fall within the range of North Rico background concentrations of lead. These comparisons based on the earlier study (ARCO, 1996c) suggest that concentrations of lead are naturally occurring and have not been increased by any discharges or redistribution of mine wastes.

3.2.3 Contaminants Compared to Guideline Values

Colorado does not have promulgated state standards for lead in soil. As previously discussed, remediation goals will be determined for residential and non-residential exposure units at the Site using risk-based modeling approaches recommended by U.S. EPA (U.S. EPA, 1994, 1998, and 2003) and described in Section 3.1.

3.2.4 Present and Future Use Exposure Pathways

Land-use is an important consideration in the identification of exposure areas. Based on land-use and surficial geology, six distinct exposure areas were previously identified within Rico (see Figure 5). These areas are: North Rico Residential, South Rico Residential, Future Residential West, Future Residential East, River Corridor, and the Silver Creek Alluvial Fan. With the exception of the River Corridor, all exposure areas are either currently residential or may be designated for future residential use. This includes some areas of the Site that are currently designated as commercial or light industrial (see Figure 3). To ensure the risk-based approaches applied to this Site are conservative and protective of all potential future uses, the potential human exposure pathways evaluated in this Application will be the same for both present and future uses of the Rico Site, and will be based on residential exposure (using the IEUBK model) in all areas except the River Corridor, which will be evaluated based on recreational exposures (using the ALM model). Note that the previously delineated exposure areas will be reviewed and updated if/as appropriate based on current land use and planning.

Exposure to lead can occur by many different pathways and from many different sources. Both the IEUBK and ALM models incorporate inputs to address the contribution of multiple sources or baseline exposures to resultant blood lead predictions. The specific pathways addressed by the risk-based model approaches proposed for this Application are discussed below.

In the IEUBK model, intake rates are estimated for the quantities of lead inhaled or ingested from soil, dust, drinking water, air, and food. The IEUBK model also considers ingestion of lead in

paint, but this is typically addressed in terms of its contribution to the measured concentration of lead in soil or estimated in dust. Ingestion of lead via soil, dust, drinking water and food and inhalation via air are the pathways addressed in the IEUBK modeling. Because not all of the lead entering the body through the respiratory or gastrointestinal (GI) tracts is actually absorbed into the systemic circulation of the blood (i.e., bioavailable), the IEUBK model also incorporates differences in the bioavailability of lead from different environmental media.

The ALM model uses site-specific data on soil lead concentrations and includes a variable to represent baseline exposure via an input of "typical blood lead concentration (µg/dl) in adults (i.e., women of child-bearing age) in the absence of exposures to the site that is being assessed" (U.S. EPA 2003). The ALM incorporates intake rates for lead in soil and appropriately considers ingestion as the primary route of exposure to lead.

3.2.5 Areas/Sources of Contamination

The source of the lead in soils may be attributable to mining/processing activities, lead paint, other anthropogenic sources or high naturally occurring levels of lead. Figures 5 and 6 depict known surface soil lead characterization samples collected previously for the Rico townsite.

3.2.6 Contaminant Mobilities

As described previously, available groundwater data from Rico indicates that lead has not migrated from soils to groundwater. Given that lead is not very soluble, the apparent absence of transport via this mechanism is reasonable. There may, however, be some potential for windblown transport of mining and processing materials and wastes, or naturally occurring high lead soils. It is possible that the present distribution of lead in soils reflects, at least in part, the impact of this transport pathway. Additionally, the risk-based approach to determining cleanup levels for the site proposed in this Application relies on two models, IEUBK and ALM, which were developed specifically to determine soil lead cleanup levels protective of all exposure pathways that might be affected by lead in soil (e.g., indoor dust and airborne particulates). Consequently, the mobility of lead within and between environmental media is captured by the models themselves and not addressed further within this Application.

3.3 Risk-Based Analysis of Exposure Pathways

3.3.1 Risk Determination for Lead Exposures

As previously described, lead risks will be evaluated using a pharmacokinetic model to predict blood lead concentrations in children and adults, which may then be compared to blood lead levels associated with adverse health effects as reported in studies of lead exposure in humans to establish appropriate risk-based remedial targets for the Site.

For assessing risks to children, U.S. EPA's IEUBK model is used to predict blood lead concentrations from exposure to lead in the environment for a hypothetical child or population of children (aged 6 months to 7 years) (U.S. EPA, 1994 and 1998). For adults, U.S. EPA's Technical Workgroup for Lead (U.S. EPA, 2003) recommends a methodology for assessing lead exposure risks to adults using a biokinetic slope factor approach incorporated into the ALM model. A discussion of the pharmacokinetic parameters and assumptions required as inputs to both the child and adult lead risk models will be included in the Phase I Risk Assessment and Final Data Report documenting the proposed risk-based evaluation.

4.0 Proposal for Clean-Up

Specific clean-up plans will be incorporated into documents submitted subsequent to this Application as follows:

- Phase I Work Plan and Preliminary Data Report – This document will present an evaluation of the 2003 U.S. EPA soil sampling results (assuming timely receipt of all relevant information including final data validation), a preliminary assessment of the results of the additional sampling and analysis to be performed pursuant to this VCUP Application, and plans for Phase I clean-up of townsite properties identified as potentially posing an immediate health risk. The soil lead concentration currently proposed as presenting an immediate health risk is 3,000 ppm. In addition, a site-specific plan for remediation of the Van Winkle mine site will be included. The Van Winkle mine site and four properties identified by U.S. EPA (2004) as appropriate for clean-up during Phase I are shown on Figure 9. Additional properties, if any, identified for Phase I clean-up by CDPHE will be located on a revised map that will be included in the Phase I Work Plan and Preliminary Data Report.
- Phase I Risk Assessment and Final Data Report – This report will present the results (including data validation) and final evaluation of the Phase I soil sampling and analyses, and the detailed methodology and results of the human health risk assessment. These results will provide the basis for assessing the protectiveness and permanence of Phase I clean-ups, and provide the health risk-based action level(s) to guide Phase II remediation of lead in soils at additional properties.
- Phase II Work Plan – This document will present the detailed remediation plan for properties exceeding one or more specified action levels as determined by the health-based risk assessment and related evaluation and address, as appropriate, institutional controls (ICs) for future development.
- Completion Report/No Further Action Determination – Upon completion of all clean-up pursuant to this VCUP Application, a final report will be prepared documenting the work performed and compliance with all the relevant requirements of the VCUP Application and the associated work plans and reports.

To assure that property owners and residents are well informed of the investigation and cleanup efforts, the following general communication and coordination protocols will be followed by the Rico Work Group and the Town during investigation and cleanup of Rico townsite soils:

- Identification of Property Ownership – Using Town and/or County records, a map will be prepared identifying ownership of all parcels within the Site boundaries for use in planning of sampling and clean-up activities.
- Notification of Property Owners – General information will be provided to all property owners regarding Rico's mining history, lead issues, the role of the Rico Work Group and the Town, the proposed sampling program, possible remedial actions and proposed schedule of significant VCUP activities.
- Access Agreements – Access agreements will be obtained from property owners prior to collection of samples or performance of clean-up activities.
- Notification of Sampling – Property owners will be notified of the estimated date and time of sampling.
- Notification of Results – Soil sampling results will be included in the Phase I Work Plan and Preliminary Data Report. Owners of properties with elevated soil lead levels deemed to pose a potential immediate health risk (currently proposed at 3,000 ppm) will be individually notified of the results for their properties.

- Development of Yard/Lot-Specific Clean-up Activities – Representatives of the Applicants will meet with each affected property owner to discuss specific clean-up actions at their property.
- Public Information Program – The Rico Work Group and the Town will provide regular progress updates to the community and other interested parties.

4.1 Remediation Alternatives

The clean-up methods for lead-impacted soils in Rico will vary depending upon the size and land-use of the affected property, as well as the immediacy of potential health risks posed by lead in surficial soils at the property. Properties within the previously described soil sampling Zone 1 identified as having surface lead concentrations that may present an immediate health risk (currently proposed at 3,000 ppm) will be addressed as part of Phase I during the 2004 construction season. These properties will be identified in cooperation with CDPHE prior to the Applicants' submittal of the Phase I Work Plan and Preliminary Data Report. Figure 9 identifies the location of the Van Winkle mine site property and four properties identified by the U.S. EPA based on their recent sampling (U.S. EPA, 2004) as appropriate for Phase I clean-up.

The following sections describe planned Phase I remediation activities for the Van Winkle mine site property and properties that may pose an immediate health risk, and Phase II remediation of other properties within soil sampling Zone 1 with elevated lead concentrations exceeding the applicable final action level(s) as determined by the health-based risk assessment and related evaluations.

4.1.1 Phase I

Van Winkle Mine Site – This property encompasses approximately 2.5 acres and is the location of the historic Van Winkle head frame and its associated waste rock pile. Surface lead concentrations may exceed 8,000 ppm based on available data. A site-specific plan for the Van Winkle property will be submitted with the Phase I Work Plan and Preliminary Data Report. Given the size of the site and its similarity to other waste rock sites in the area, the clean-up will rely on techniques that prevent human exposure to the existing waste rock, reduce the potential release of dissolved-phase metals, and provide for the long-term stability of the remediated area. Specific measures that will be incorporated into the clean-up plan will be designed to reduce infiltration, runon/runoff, and direct human contact. Waste materials may be consolidated to achieve proper grades and/or to minimize the size of the area to be remediated. It is anticipated that these measures will be similar to those successfully implemented at other tailings and waste rock sites as part of the previous VCUP clean-ups in the Rico area. Lead-contaminated soils removed from the site will be transported to a temporary staging area or permanent consolidation area in the vicinity to be developed as part of Phase I and Phase II activities.

Phase I Remediation of Residential Properties - Prior to the submittal of the Phase I Work Plan and Preliminary Data Report, the Applicants and CDPHE will cooperate to identify residential properties with surficial soils deemed to potentially pose an immediate health risk (currently proposed at 3,000 ppm) for cleanup during the 2004 construction season. A brief, property-specific plan for each such identified property will be submitted with the Phase I Work Plan and Preliminary Data Report. A key criterion of the plans will be the establishment of a minimum of 12 inches of clean soil at each affected property. This criterion will be met through a combination of high-lead soil removal and the placement of clean soil. High concentration lead soils removed from each property will be moved to a temporary staging area or permanent consolidation area in

the vicinity. Borrow areas used as a source of clean soils will first be sampled to verify low metals concentrations. Final reclamation of the clean soil surface will depend on the nature of the original surface and cover. It is anticipated that the final surface will either be comprised of erosion resistant "rock mulch" (borrowed as the clean soil backfill), or revegetated consistent with the original conditions at the site. When replacing existing manicured lawn, it is anticipated that sod placement will generally prove most practical. Watering and maintenance following placement will be the responsibility of the homeowner. Areas that were not previously manicured lawns will be replaced with like kind vegetation or "rock mulch". If sod is not practical or consistent with the pre-existing vegetation, natural grass seeding or hydromulching would be employed.

Special consideration will be given to protection of septic systems, propane tanks and lines, other utilities, fences, retaining walls, concrete features (e.g., patios, sidewalks) and sub-surface irrigation systems during all on-site VCUP activities. In order to protect existing utilities, the location of buried public utilities will be shown on a scaled lot map based on locates arranged through the Utility Notification Center of Colorado. The location of private buried utilities will be based on the owner's description and site observations, confirmed as necessary by probing/pitting during excavation. Soil removal will terminate at the drip line of established trees and shrubs to preserve these high value plantings. Should any damage to such features occur in the course of the work, the damaged property will be repaired or replaced in kind at the expense of the Rico Work Group. Also, standard construction controls will be implemented during all excavation and grading operations to control fugitive dust. More detailed guidelines for yard clean-up activities will be included in the Phase I Work Plan and Preliminary Data Report.

4.1.2 Phase II

Other Properties with Elevated Lead Concentrations – Those properties not considered to pose an immediate health risk will be evaluated for remediation based on a health risk assessment to be completed as part of Phase I. The health risk assessment will identify one or more action levels for lead in soils, based upon the exposure scenarios (i.e., residential, commercial/industrial or recreational). The analytical results from the Phase I sampling will be compared to the action levels to identify additional properties within soil sampling Zone 1 that require remediation. For each property that exceeds the appropriate action level, the Phase II Work Plan will include a plan that will establish a criterion of a minimum of 12 inches of clean soil at each property. The Phase II Work Plan will include diagrams of properties to be remediated and descriptions of any measures necessary to assure the long-term integrity of remedial actions. Because these properties do not pose any potential for immediate health risk, remediation activities are proposed to be completed during the 2005 construction season. General guidelines for the clean-up activities will be as described above in Section 4.1.1.

For undeveloped properties in soil sampling Zone 2, soil lead data will not be available on a site by site basis. Rather, it is anticipated that appropriate institutional controls (ICs) will be established for future development if deemed necessary following the sampling and risk assessment.

4.2 Verification and Completion Report

If treatment of contaminated media is part of the recommended remedial alternative, the sampling program associated with the verification of treatment will be described in each subsequent submission that includes a clean-up plan. In the case of removal of high lead soils and replacement with clean soils, it is anticipated that sampling and analysis of the associated borrow

areas for lead and measurement of the depths of placed clean soils will be implemented to document attainment of the clean-up goals.

A Completion Report will be submitted upon completion of all cleanup activities identified under the VCUP application. Consistent with the VCUP program requirements, this Completion Report will also serve as a petition for a 'No Further Action Determination'.

4.3 Schedule

The proposed schedule of submittal of key deliverables and of major anticipated elements of work pursuant to implementation of this VCUP Application is as follows:

Item	Date
	2004
Submit *VCUP Application*	February
Receive VCUP Application Approval	April
Public Meeting	April
Obtain Access Agreements	April – May
Soil Lead Sampling	May – July
Phase I Work Plan and Preliminary Data Report	August
Van Winkle Mine Site Clean-up	August – October
Yard Clean-up for Immediate Risk Properties	August – October
Phase I Risk Assessment and Final Data Report	November
	2005
Phase II Work Plan	March
Phase II Yard Clean-up	May - October
Completion Report/No Further Action Determination	November

5.0 References

ARCO, 1996a. Atlantic Richfield Company, Rico Properties, L.L.C., Town of Rico. Voluntary Cleanup and Redevelopment Act Application for Columbia and Old Pro Patria Mill Tailings and Silver Swan East Wasterock Pile. Submitted to Colorado Department of Public Health & Environment (CDPHE). January 1996.

ARCO, 1996b. Atlantic Richfield Company, Rico Properties, L.L.C., Town of Rico. Voluntary Cleanup and Redevelopment Act Application for Santa Cruz Mine. Submitted to CDPHE. March 1996.

ARCO, 1996c. Atlantic Richfield Company, Rico Properties, L.L.C., Town of Rico. Voluntary Cleanup and Redevelopment Act Application for Grand View Smelter. Submitted to CDPHE. April 1996.

CDC, 1997. Center for Disease Control. Screening Young Children for Lead Poisoning: Guidance for State and Local Public Health Officials.

CDC, 2002. Center for Disease Control. Managing Elevated Blood Lead Levels Among Young Children: Recommendations from the Advisory Committee on Childhood Lead Poisoning Prevention

CDPHE, 2003. Colorado Department of Public Health and Environment (CDPHE). Targeted Brownfields Assessment, Analytical Results Report and Appendix C - Data Validation Report, North Rico Light Industrial Park and County Maintenance Barn Sites, Rico, Colorado. April 2003.

Dames and Moore, 1981. Flood hazard areas, Anaconda mining sites, Dolores River and Silver Creek, Rico, Colorado. Golden, Colorado.

McKnight, 1974. Geology and Ore Deposits of the Rico District, Colorado. US Geological Survey Professional Paper 723.

Ransome, F.L., 1901. The Ore Deposits of the Rico Mountains, Colorado. U.S. Geological Survey Annual Report, 22nd, Part 2: 229-398.

Titan, 1996. Titan Environmental Corporation. Geologic Mapping and Geochemical Sampling at Rico, Colorado, October, 1996. Prepared by Michael D. Russ for Titan Environmental Corporation, Englewood, Colorado. January 1996.

U.S. EPA, 1994. Memorandum: OSWER Directive: Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities. Office of Solid Waste and Emergency Response. OSWER #9355.4-12. August 1994.

U.S. EPA, 1998. Memorandum: OSWER Directive: Clarification to the 1994 Revised Interim Soil Lead (Pb) Guidance for CERCLA Sites and RCRA Corrective Action Facilities. Office of Solid Waste and Emergency Response. EPA/540/F-98/030. OSWER #9200.4-27P. August 1998.

U.S. EPA, 2001. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. Peer Review Draft. Office of Emergency and Remedial Response. OSWER #9355.4-24. March 2001.

U.S. EPA, 2003. Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil. (FINAL) Technical Review Workgroup. EPA-540-R-03-001. OSWER #9285.7-54. January 2003.

U.S. EPA, 2004. Analytical Results Report for Focused Site Inspection, Rico-Argentine, START2 – Region VIII, TDD No. 0308-0013, February 2004.

Walsh, 1995. Walsh Environmental Scientists and Engineers. Phase I and Phase II Environmental Site Assessment, Rico, Colorado. Prepared for Davis, Graham, and Stubbs, Denver, Colorado, by Walsh Environmental Scientists and Engineers, Boulder, Colorado. May 1995.